

Resilience in Response to Life Stress:

The Effects of Coping Style

and Cognitive Hardiness on the Psychological

Health of Mature Age Students.

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I declare that this report is my own work and that the contributions of others have
been duly acknowledged.

Signed:..........

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Literature Review

Abstract

This review evaluates the literature concerning individual differences in response to adverse life events, with a particular focus on the factors and mechanisms that may be protective or buffer an individual against the negative effects of life stress. The review examines gender and life span differences in the life stress/psychological and physical health equation, and examines the role of turning points in changing adaptational trajectories in life. It is argued that research should focus on protective mechanisms which may be developed through successful engagement with adversity, rather than on protective factors, which are more likely to be a 'given' and not open to change. It is argued that protective mechanisms (such as coping style) are processes amenable to intervention, and that their study can extend our knowledge of the promotion of resilience. The review focusses on three possible protective mechanisms: coping style, cognitive hardiness and explanatory style, and the two models which have been suggested to test such variables: the main and buffer effects models. Finally, implications for clinical and educational intervention are discussed, and suggestions are made for future research concerning the promotion of resilient outcomes.

Almost since the beginnings of medical and psychiatric practice there has been recognition that adverse life experiences are associated with and precipitate physical and psychological dysfunction (Garmezy & Rutter, 1985). However, there has also been growing interest in the concept of resilience in response to such adversity, as along with reports of increased dysfunction came the knowledge that some individuals were either unaffected or actually strengthened by negative life events (Rutter, 1990). Resilience has been described as successful adaptation despite challenging or threatening circumstances (Masten, Best & Garmezy, 1990), and research has begun to focus on the factors that promote resilience. This literature review will present and critically evaluate current literature regarding factors relating to resilience in response to life stress, and point to issues on which future research could fruitfully focus.

Resilience

Rutter (1990) states that resilience relates to individual differences in response to the adverse effects of difficult life events. In understanding these individual differences, it is useful to consider the life stress/physical and psychological health equation. The general premise is that as life stress increases for an individual, so too do physical and psychological dysfunction. Just how much one leads to the other is a keenly debated issue. Kessler, Price and Wortman (1985) report only a small direct effect of life stress on psychological and physical functioning, whilst others have found a significant direct effect (Clements & Turpin, 1996; Sarason, Johnson & Siegel, 1978). There are certainly many accounts of deleterious effects of high levels of life stress on health, such as increased incidence of heart disease and cancer (e.g. Sarason & Sarason, 1984; Theorell & Rahe, 1971).

Somewhat ironically, it seems that the development of resilience is related to experiencing adversity, or more specifically, the successful negotiation of adversity (Amir & Sol, 1999; Rutter & Quinton, 1984). Kobasa (1979) argues that increased levels of stress are associated with increased opportunities, and it appears that resilient individuals are best able to exploit these opportunities without succumbing to stress. Rather like a robust immune system which depends on exposure to bacteria and viruses to strengthen itself, so resilient individuals need exposure to adversity in order to inoculate themselves against future adversity. Some people develop this psychological immunity better than others, and Velleman and Orford (1999) observe that there are adverse circumstances which appear harmful to some, yet the same circumstances can actually enhance the adjustment of others. However, Fontana and Rosenheck (1998) found a levelling off of psychological benefits at high levels of traumatic exposure, so there appears to be an optimum level of exposure, which is likely to vary according to individuals and context.

An understanding of protective and risk factors is essential in any discussion concerning resilience. Pellegrini (1990) states that protective and risk factors are usually assumed to be opposite sides of the same coin: that is, the absence of a risk factor is taken to be the presence of a protective factor. A protective factor is a variable which increases an individual's chances of negotiating adversity, such as personality variables like self-esteem and autonomy, or family cohesion or harmony. A risk factor can be seen as the opposite: for example, poor self-esteem and family discord have been described as risk factors (Masten & Garmezy, 1985).

It is likely that protective factors combine together, in much the same way as risk factors (Fergusson & Lynskey, 1996). One protective factor such as high IQ may not insulate an individual against risk factors such as loss of a parent and lack of financial

resources, but if high IQ is combined with a temperament that facilitates good social and family support, this combination may successfully buffer the individual against a poor outcome. In her notion of self-complexity, Linville (1987) provides a good example of how factors can combine to produce better health outcomes. She states that the greater number of self-aspects or self-complexity an individual has (e.g. they recognise themselves to be a good friend, parent, worker, student), the more chance they have of warding off the ill effects of illness and depression.

However Rutter (1990) makes the point that in the examination of resilience, it is imperative to understand the difference between protective and risk factors and protective and risk mechanisms. Furthermore, Rutter argues that the study of the promotion of resilience involves particular focus on protective mechanisms. He observes: "The search is not for factors that make us feel good but for processes that protect us against risk" (p.186, Rutter, 1990). A protective factor may be static and perhaps a given in an individual's life, whilst protective mechanisms are generated through the process of successful engagement with adversity. The development of protective mechanisms may well be facilitated by the presence of protective factors: e.g. being born with an even and happy temperament (a factor) may well encourage a child to develop better social skills (a mechanism), both of which are likely to promote resilient responses.

Research focusing on protective factors such as IQ or temperament has clearly been useful in our overall understanding of resilient outcomes. Some protective factors do have implications for intervention: for example the type of attachment a child has with a parent has been identified as critical for their future development, and could be seen as a protective or risk factor for that child (Rutter 1990). However, this knowledge could also be put to use in educational or therapeutic interventions with

parents to encourage stronger attachments with their children. Generally though, research focusing on protective mechanisms provides a direction for actually encouraging resilient responses, as mechanisms such as coping or attributional style are amenable to intervention through therapy or education.

It has been argued that the development of protective mechanisms concerns the negotiation of key turning points in people's lives (Leonard & Burns, 1999; Rutter, 1990). Turning points are described as events or transitions in an individual's life which they subjectively perceive to be important, such as marriage, birth of a child, death of a family member or friend, accident or illness, career or financial changes, or significant personal growth (Leonard & Burns, 1999). What one person describes as a turning point another may not, and these experiences may differ according to the stage of life in which they are experienced.

Rutter (1990) states that a successfully negotiated turning point can alter an individual's life trajectory from a risk pathway to a protective one. Therefore, the timing as well as the nature of the experiences is important. For example, the adult choice of a lifetime partner who is loving and stable could mean the effects of an abused childhood are significantly minimised. Furthermore, experiences which may be viewed negatively at the time may in fact be protective at a later date. Edelman's (1995) account of women whose mothers had died reports that despite the tragedy of the time, many of these "motherless daughters" later became self-reliant and independent. The women themselves related this strength to the death of their mothers, and the subsequent changes the death had wrought in their lives.

It is clear from this examination of the negotiation of turning points, that resilience involves a relative rather than an absolute resistance to adversity. Velleman and Orford (1999) state that resilience is a process open to change, rather than being a

static attribute, and that traits or behaviours which may be protective at one time may not be so helpful at another. Garmezy (1989) agrees, saying that changes are required in adaptational trajectories over time. On this basis, subsequent discussion focusses on resilience issues relating to children and adults.

Children and Adults

A preponderance of literature focusses on children and the factors that promote good and bad outcomes. This is not surprising, as if factors can be identified that promote good outcomes for children, then opportunities for early intervention abound. Garmezy's (1989) "Project Competence" is one such example of research informing early intervention, and Garmezy and colleagues worked with children and their families identified as at risk in order to encourage more flexible and resilient responses.

According to Fergusson and Lynskey (1996), resilience in children is comprised of two major elements: first, a high exposure to family adversity (such as extreme poverty) and second, the absence of externalising problems, such as disruptiveness or aggression. Masten, Morrison, Pellegrini and Tellegen (1989) speak of resilience in children as being competence despite exposure to stressful life circumstances, and they further refine competence in terms of three factors: the ability to play well, work well and love well. This means that resilient children have good peer relationships, achieve well at school, and enjoy positive relationships with their families. However, Luthar (1991, 1993) highlights the differences between emotional health and behavioural competence. Some children he studied who had been labelled as resilient because of good school grades and behaviour were found to be anxious and depressed. It is argued that it is important to include indices of emotional and

psychological adjustment along with behavioural indices of competence in the measurement of resilience (Luthar, 1991, 1993; Masten & Garmezy, 1985).

A range of protective factors and mechanisms have been identified in child-based research. Fergusson and Lynskey (1996) identify IQ and problem-solving ability, gender, external relationships and affiliations, parental attachment, temperament and peer relationships. Losel, Bender and Bliesener (1993) report self-efficacy and educational climate to be important, and state that resilient children are more likely to have a flexible temperament, perceive themselves as less helpless, are active problem solvers, have a more realistic view of the future, are more intelligent, and have positive self-concepts. Garmezy (1989) proposes that living with and helping others (e.g. caring for a sick parent) may create life skills and bolster resilience. Masten et al. (1989) report the importance of interpersonal awareness and social comprehension, a reflective cognitive style, divergent thinking, and the ability to generate and appreciate humour. Masten et al. (1990) also observe that resilient children have a positive relationship with at least one competent adult, are good learners and problem-solvers and are engaging to others.

Unfortunately, Masten et al. (1989) indicate that children with the fewest protective assets are the most likely to be challenged by adverse life events: those least likely to cope with adverse life events are those most likely to experience them. However, we already know that it is not negative life events per se that cause damage, but how these adversities interact with other protective factors and mechanisms. Not all children who experience high levels of adversity manifest high levels of dysfunction.

Turning to the adult literature, many of the mechanisms and factors thought to be protective or risk related in childhood are also implicated in adult life. For instance,

genetic factors and other biological substrates (e.g. birth complications, early puberty) may have impacts registering well into adulthood. Rutter (1985, 1989) argues that the process of adversity steeling individuals rather than sensitising them is characterised by a range of mechanisms, which are processes amenable to possible change for the better. He lists the ability to act rather than react, the role of planning, cognitive sets or schemas, coping styles and self-esteem as possible moderating variables in the stress/health equation. He also notes that the presence of a supportive spouse was a major protective factor amongst a group of high risk institutionally reared women, but suggests that good planning (once again a protective mechanism) may well underpin the choice of spouse. Schissel (1993) comments that financial security operates as a buffer against some risk factors, probably by allowing more flexibility in response. For example, being made redundant in one's work loses some of its sting if financial security is not completely dependent on income. Valentine and Feinauer (1993) studied female survivors of sexual abuse, and found resilient outcomes were associated with supportive relationships both inside and outside the family, positive self-regard, a sense of spirituality or strong philosophy of life, the ability to externalise blame and an internal locus of control.

Gender Differences

Along with differences reported according to age, a range of gender differences has been noted. Differences are reported in terms of the nature of adverse life experiences likely to be encountered, and also in terms of how these negative experiences are managed. Men are more likely to experience violent or accident based trauma, whilst women are more likely to be traumatised through sexual abuse or assault, or domestic violence (Herman, 1997). It could be argued that differences in how these events are managed develop simply because the experiences encountered

according to gender require such different responses. For example, it is likely that experiencing a serious road accident (more likely to be a male experience) requires a different set of responses to the trauma of living with sexual abuse over a number of years (more likely to be a female experience). Briefly harking back to the argument concerning turning points or developmental milestones, it is also significant to note that these extreme events of traumatic accident or sexual abuse are more likely to occur around early adulthood/late adolescence.

Schissel (1993) notes that men and women differ even when exposed to the same adversity, and concludes that the causal origins of resilience are different for men and women. For example, male children of alcoholic parents are more likely to become alcoholics themselves, whilst females are more resistant to alcohol abuse, with the proviso that they have a degree of independence. This provides another good example of how factors can combine to create a protective buffer: that is if females have some financial and emotional independence, then the impact of the risk factor of having an alcoholic parent is reduced.

Different life adversities are managed in a number of different ways according to gender. Licitra-Kleckler and Waas (1993) report that girls are more prone to internalising symptomatology (e.g. depression), whilst boys are more likely to externalise (e.g. delinquency). Seiffge-Krenke (1993) found that female adolescents are quickly sensitised to problems and begin active coping early, but that they are more pessimistic about the success of their active coping than are male adolescents. To extend this argument, it is likely that girls do not sustain their initial active coping, as they are less convinced of its efficacy. Boys tend to challenge more in their coping behaviour, whilst girls tend to be more resigned (Seiffge-Krenke, 1993). Billings and Moos (1981) go one step further with this difference, stating that females are more

likely than males to use avoidance coping, which is generally associated with unhelpful outcomes.

If one accepts that females are quickly sensitised to problems, it also fits that they are more aware of their immediate social context. Not surprisingly, social support seems to be of more importance to women in the successful management of adversity (Billings & Moos, 1981). Carver, Weintraub and Scheir (1989) conclude that women seek social support for emotional and instrumental reasons, and that they focus on and vent emotions more than men. By contrast, Carver et al. (1989) report that men are more likely to use alcohol as a coping strategy. Werner (1989) also notes that the resilient women in her longitudinal study drew on a larger number of sources of support than did her resilient men. As outlined, an enormous range of factors and mechanisms including age and gender have been examined in research concerning resilience, and a brief discussion follows in an attempt to draw together some themes in these variables.

Variables Implicated in Resilience

As previously argued, the distinction between protective and risk factors and protective and risk mechanisms is an important one, particularly in terms of possible intervention to boost resilient outcomes in response to adversity. If protective mechanisms are more amenable to change, then the distinction between external and internal resources available to an individual may also be useful (Rutter, 1990). Rutter argues that both external and internal resources need to be considered in the person/environment interaction relating to resilient outcomes. Kenny and Rice (1995) nominate internal resources as including coping skills, self-efficacy and general knowledge, whilst external resources include sources of support: e.g. the quality of

attachment in relationships, and variables such as financial resources, or socio-economic status.

Some of the protective mechanisms which could be classified as internal resources are coping style (Lazarus & Folkman, 1984), explanatory style (Peterson et al., 1982), cognitive hardiness (Kobasa, 1979), problem solving ability (Rutter, 1990), self-efficacy (Hoeltje, Zubrick & Garton, 1996), self-complexity (Linville, 1987), optimism (Seligman, 1990) and the ability to generate and enjoy humour (Masten, 1982). External resources include social support (Billings & Moos, 1981; Kessler et al., 1985), social resources (Losel et al., 1993), and attachment to parents (Kenny & Rice, 1995).

Of these variables, three key protective mechanisms which have also been described as internal resources will be examined: coping style, cognitive hardiness and explanatory style. It will be argued that these three mechanisms also lend themselves to therapeutic and educational intervention, and thus have useful implications in the promotion of resilience.

Coping Style

A plethora of research focuses on coping style as an important variable in understanding outcomes following life stress (Billings & Moos, 1981; Carver et al., 1989; Haines & Williams, 1997; Kessler et al., 1985; Lazarus & Folkman, 1984; Schissel, 1993; Seiffge-Krenke, 1993).

Lazarus and Folkman (1984) define coping as a "subset of adaptational activities that involve effort " (p.132). They argue that coping is not necessarily the same as good outcome: that is it is possible to employ coping mechanisms which are not commensurate with good outcome. For example, denial or denial-like processes can have either positive or negative outcomes, depending on the context. Therefore,

definitions of coping should include efforts to manage stressful situations, regardless of outcome. "Coping relates to all efforts to manage taxing demands, without regard to their efficacy or inherent value" (Lazarus & Folkman, 1984, p. 138).

A further aspect of the coping literature that has engendered debate is whether coping styles are fixed across all contexts or flexible and context-based processes (see Lazarus & Folkman, 1984 for review). Lazarus and Folkman (1984) state that the treatment of coping as a trait or style is problematic, as reactions are clearly context dependent, and that coping processes have multidimensional qualities. However, they deduce that people still have preferred modes of coping over time. In another review, Kessler et al. (1985) state that there is little evidence of consistency of coping styles across situations, and that the choice of coping style is influenced by the person's appraisal of the situation.

Another contentious "chicken and egg" issue in the coping literature concerns whether coping methods influence psychological symptoms more than psychological symptoms influence the choice of coping methods (Coffey, Leitenberg, Henning, Turner, & Bennett, 1996). For example, if an avoidant coping style is associated with depression (Aldwin & Revenson, 1987), does the avoidant coping 'cause' the depression, or do the depressive symptoms encourage an avoidant coping style? As is common in this area of endeavour, causality is unlikely to be established. Rather, correlational connections between these variables are noted.

Some confusion occurs in the coping literature in terms of a lack of common conceptualisation about categories of coping style (Endler & Parker, 1990; Nowack, 1989). For example, some studies refer to escapism styles of coping as being the most deleterious to health and psychological adjustment (Proulx, Koverola, Federowicz & Kral, 1995), whilst others describe this style of coping as avoidance (Billings &

Moos, 1981). Nowack (1989) further states that congruence may be found in the literature if the themes of *approach* and *avoidance* styles of coping are utilised. Commonly used terms for approach-oriented coping are task or problem-focused coping, which refer to active attempts to deal with stress; whilst common terms for avoidance-oriented coping are escapism or emotion-focused coping, which refer to strategies such as ruminating or emotional responses to stress (Carver et al., 1989; Endler & Parker, 1990). Some consistency has been reported in the literature concerning these coping styles, with approach or task-focused coping generally associated with better outcomes (e.g., less psychological dysfunction), whilst avoidance or emotion-focused coping is generally associated with poorer outcomes (Higgins & Endler, 1995).

Proulx et al. (1995) reported that the coping strategy of escapism was the most powerful predictor of distress in survivors of sexual victimisation. Coffey et al. (1996) found that disengagement methods of coping lead to poorer current functioning. Pearce (1997) found that an expressive coping style led to better outcomes for individuals who had been emotionally abused as children. Billings and Moos (1981) explored coping styles in terms of active behavioural, active cognitive and avoidance styles, and found that the more reliance on active coping measures and the less on avoidance measures, the better the outcome. Three main models of coping have been described by Seiffge-Krenke (1993): active, internal and withdrawal. She found the best approach to be active coping, with 'at risk' populations manifesting more ambivalent and disorganised patterns of coping responses. Normal populations were more consistent in their coping styles across situations.

It is clear that no single coping strategy is likely to be successful in all situations (for a review see Kessler et al., 1985). Nowack (1989) reports strong evidence that

avoidance may be more effective than approach strategies in situations that are largely uncontrollable. Salient issues include the type of problem faced, at what stage of development it is faced, and what degree of stress is experienced, and in what context the event occurs. For example, if pregnancy occurs as a planned event in a steady adult relationship, it is a completely different experience from an unplanned teenage pregnancy. This same event is likely to be associated with quite different levels of stress at different developmental stages. A range of coping responses is required according to context: as Rutter (1990) states, resilient individuals have a flexible range of repertoires accessible to them.

Cognitive Hardiness

Kobasa (1979) studied the impact of personality variables in high stress individuals in relation to illness, and in particular she examined high stress individuals with low incidence of illness. She coined the term "cognitive hardiness" to describe the features of these resilient individuals. Cognitive hardiness is made up of three factors. First, hardy individuals believe that they can *control* or influence events. Second, they have a *commitment* to activities and their interpersonal relationships. In particular, hardy individuals have a commitment to self, in that they recognize their own distinctive values, goals and priorities in life. Lastly, they view change as a *challenge* rather than as a threat, and are predisposed to be cognitively flexible.

Other researchers (Hull, Van Treuren & Virnelli, 1987) have argued that cognitive hardiness is not a unitary phenomenon, and should be treated as involving three separate phenomena as outlined above. Of these three they found that only control and commitment had adequate psychometric properties and were systematically related to health outcomes. Nowack (1990) developed a scale to measure cognitive hardiness which was specifically designed to address such

criticisms of the measurement of cognitive hardiness, and reported that cognitive hardiness contributed significantly to the prediction of psychological distress but not physical illness. Oullette (1993) concluded that cognitive hardiness was a consistent predictor of health, and recommended its further investigation. Older adults have been reported to be less hardy than younger adults or adolescents (Hannah & Morrissey, 1986), which was one of the prompts for Sharpley and Yardley's (1999) investigation of older adults.

Sharpley and Yardley's (1999) study of post-retirement men and women found that when both explanatory style and cognitive hardiness were examined, the strongest predictor of depression/happiness was cognitive hardiness. Sharpley and Yardley give examples of the three aspects of cognitive hardiness: control, commitment and challenge. Positive associations with happiness scores were made by a general belief in one's competence (*control*), gaining personal meaning from social/political activities (*commitment*) and confidence in one's ability to handle change and/or social interactions (*challenge*).

Kobasa (1979) and Kobasa and Puccetti (1983) describe cognitive hardiness as a personality variable, which has both cognitive and behavioural aspects. Nowack (1989) describes it as a "conceptually distinct individual coping variable" (p.148), and as a meta-construct of three relatively stable appraisals which function as a buffer in the life stress/current adjustment relationship. As Nowack states, the components of commitment, control and challenge "are important cognitions that appear to moderate the impact of daily work and life stress on well-being." (p. 156). Viewed as a coping variable, cognitive hardiness could certainly be described as a protective mechanism with promising implications for intervention with high risk individuals, perhaps through cognitive restructuring of such cognitions.

Nowack (1989) recommends further research focus on the additive and interactive effects of cognitive hardiness and coping style with multiple health outcome measures, as well as the replication of his findings with diverse samples, including students, adolescents and the elderly.

Explanatory Style

The final variable to be briefly considered in this review is explanatory style, which describes the beliefs an individual has about various life events (Seligman, 1990). Seligman concludes that an optimistic explanatory style is likely to promote well-being and to protect against depression, and states that three main styles of attributions are significant: pervasiveness, permanency and personalisation. Specifically, if a situation is perceived as globally pervasive (rather than specific to the event), as permanent rather than transitory, and as personally determined, chances are high that a person with this pessimistic explanatory style is likely to feel helpless and have a strong chance of being depressed. Explanatory style is said to be a learned attribute that remains stable throughout life (Peterson, 1991).

People with a pessimistic explanatory style are likely to be depressed when they encounter a negative life event. In contrast, an individual with an optimistic explanatory style tends to be more able to successfully manage difficult life events (Sharpley & Yardley, 1999).

Scheir, Weintraub and Carver (1986) similarly report that an optimistic explanatory style is positively linked with problem focused coping, seeking social support, and emphasizing the positive aspects of a stressful situation. A pessimistic explanatory style is positively associated with denial or distancing, and also focusing on stressful feelings. They conclude that an optimist's strategies are most likely to pay off.

Some problems have been reported concerning the measurement of explanatory style. Sharpley and Yardley (1999) use the Explanatory Style Questionnaire (Peterson et al. 1982) as a measure of optimism/pessimism, yet Peterson et al. (1982) do not use the measure in this summative fashion: rather, they use scores for internality, globality and stability. Peterson et al. (1982) also comment about the unreliability of attributions concerning good events, and speak of the “rough-grained nature of actual attributions about good events” (p. 296). Finally, some of Sharpley and Yardley’s (1999) subjects found the Explanatory Style Questionnaire difficult to follow, and they suggest another measure be used in future studies.

Two main models have been proposed for testing the predictive value of such protective mechanisms on the life stress/health relationship, and the discussion will now examine these.

Main and Moderator Effects Models

Just how variables such as coping style and cognitive hardiness impact on the stress/health relationship has also been an issue in the literature, and two major models have been proposed to elucidate this. These are the main (or direct) effects model and the moderator (or stress buffer) model (Aldwin & Revenson, 1987; Wilkinson, Walford & Espnes, 2000). The main effects model predicts that a variable (such as coping style) has direct and uniform effects on mental health, irrespective of the levels of adversity experienced.

The moderator or stress-buffering model proposes that a variable such as effective coping buffers or protects an individual against the effects of negative life events or stress, in an interactive process. When high levels of stress are experienced, effective coping can buffer the individual against negative effects. (See Figure 1 for further explanation).

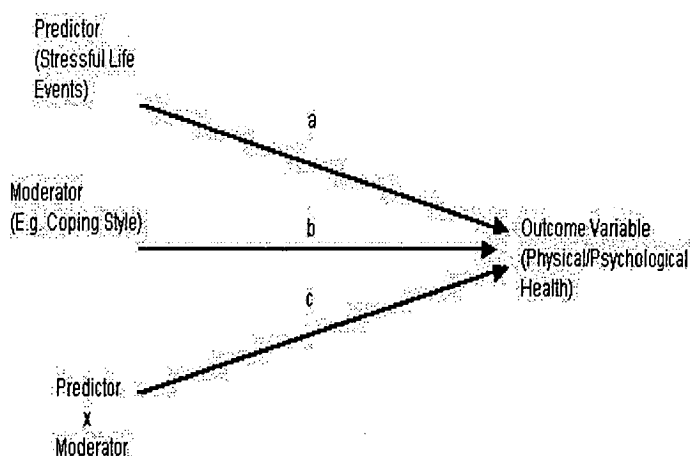


Figure 1. Moderator model (Baron & Kenny, 1986).

Note. *a* might refer to negative life events, *b* might refer to the direct effects of a variable such as coping style, and *c* refers to the interaction of these two such that the product *ab* buffers the outcome, usually operationalised as reduced scores on psychological distress measures.

In terms of coping, Wilkinson et al. (2000) found direct effects for both approach and avoidant coping, but no buffer effects. Higgins & Endler (1995) found that emotion-oriented coping had direct effects (positively predicting distress), but no buffer effects. Aldwin & Revenson (1987) report direct effects for task-oriented coping, with high levels of task-oriented coping reducing mental health dysfunction. They also report buffer effects, with high levels of task-oriented coping mitigating the effects of adversity on mental health.

Studies have reported main effects for cognitive hardiness, with high cognitive hardiness scores related to increased happiness, or lowered psychological distress (Nowack, 1989; Sharpley & Yardley, 1999), but little has been reported concerning the potential buffering effects cognitive hardiness may have on the stress/health

relationship. In fact, most studies seem to have examined only main effects, without consideration of the potential for buffering effects.

Measurement Issues: Stress, Psychological and Physical Health

Two further factors are worth consideration, as they create problems in interpreting the literature concerning life stress and health outcomes. These are the measurement of life stress and outcome measures of psychological and physical health.

A range of life events have been examined in measuring life stress, including traumatic incidents (Herman, 1997), life event stress (Sarason et al., 1978), and daily hassles (Kanner, Coyne, Schaefer & Lazarus, 1981). Traumatic events have been implicated as affecting current health and psychological functioning, particularly in relation to PTSD symptomatology (Bernat, Ronfeldt, Calhoun & Arias, 1998). It has been argued that traumatic events are recalled more reliably than adverse life events, as they are more likely to be recalled as ‘flashbulb’ memories possessing unusual vividness and memorability (Vrana & Lauterbach, 1994). Traumatic events are also thought to be cumulative in their deleterious effect on an individual over time, and are usually measured over a person’s lifetime (Herman, 1997). However, the effect of traumatic events has been notoriously difficult to measure accurately, as it is the subjective impact of the event on the individual that matters, rather than the event itself (Krinsley & Weathers, 1995). Goodman, Corcoran, Turner, Yuan and Green (1998) report an assessment method known as the Stressful Life Events Screening Questionnaire (SLESQ), which both counts the number of traumatic events and allows for their subjective impact to be taken into account.

Early research concerning life event stress used the Holmes and Rahe (1967) Social Readjustment Rating Scale (SRRS), which assigns weighted scores for events

experienced in the past year, and assumes that all denoted life events are stressful. This approach has been broadly criticised, as life events experienced positively by some (e.g. Christmas) may be negative for others. Life event measures, unlike measures of traumatic events, have been criticised as subject to memory recall problems, biases in hindsight, distortion and under-reporting of events (Vrana & Lauterbach, 1994; Zimmerman, 1983). Furthermore, an event such as the death of a close family member is likely to have a more detrimental effect for someone than an outstanding personal achievement, yet in Holmes and Rahe's (1967) scale, both are summed in the same direction.

Sarason et al. (1978) conceptualise life stress in terms of its negative impact, and they propose a measure (the Life Experiences Survey) in which participants ascribe their own weightings to life events experienced in the past 12 months. Higgins and Endler (1995) also report that only events which subjects rated as negative were related to outcome measures of distress. Clements and Turpin (1996) note that accurate recall occurs only when life events have occurred in the recent past, and suggest that 12 months is the optimum time period for measurement of life stress. This time frame has been adopted by most life stress measures (Clements & Turpin, 1996; Holmes & Rahe, 1967; Sarason et al., 1978).

As with life stress measures, there have been a number of different methods used to measure psychological and physical health in studies relating to resilience. Wilkinson et al. (2000) argue that separate measures of well-being and distress should be used, as they are different dimensions of psychological health. They propose that only measuring distress reflects a skewed picture of psychological health. Distress may be operationalised as depression, anxiety and negative affect measures, whilst well-being is operationalised through happiness, life satisfaction and positive affect

scales (Headey & Wearing, 1992). Endler and Parker (1990) and Higgins and Endler (1995) utilise measures of psychological and somatic distress, and recommend that measures of anxiety, depression and somatic symptoms are the most relevant.

Others have measured resilient outcomes in terms of behavioural indices of competence, such as scholastic success, adaptive behaviour or the lack of psychopathology (Rutter & Quinton, 1984). These approaches have been criticised by Luthar (1991) and Luthar and Zigler (1991), who argue that it is quite possible that an individual is deemed behaviourally competent, yet may have psychological difficulties such as depression or anxiety. Werner's (1989, 1993) 30 year longitudinal study of resilient individuals also indicated that not all of those who could be labelled as resilient (coping successfully with adult responsibilities) were happy or satisfied with their lives. Consequently measures of psychological distress appear to be most salient.

Conclusion

This review has focused on the protective factors and mechanisms associated with resilient outcomes, following exposure to adversity. In particular it has been argued that the study of protective factors (which are more likely to be a constant in an individual's life) is not as useful for future intervention as an understanding of protective mechanisms. It has been argued that protective mechanisms are more concerned with processes in response to adversity: that is, *how* an individual negotiates adversity. In addition, it has been suggested that research should focus on an individual's internal resources, as once again these are more process oriented and consequently more amenable to future intervention in the promotion of resilience.

The literature suggests focusing on possible protective mechanisms/internal resources of coping style and cognitive hardiness and their interaction with each

other. Many studies have focused on children and adolescents, whilst the importance of key turning points in developmental trajectories suggests studying a population who have experienced a range of these turning points in their lives, such as mature adults. In terms of protective mechanisms and their operation, it is also suggested that comparisons be made between the genders, as it appears that different mechanisms are at play. Furthermore, main or direct effects have been reported for different types of coping style and cognitive hardiness, as high levels of either are associated with lower scores on measures of dysfunction. However, there has been limited consistent study of interaction or buffering effects of such variables, and it seems that this is a promising direction for future research.

Finally, the study of resilience should focus on how best to promote resilient outcomes. Some research has pointed to reducing the incidence of adversity (e.g. number of traumatic events) as the best way to promote resilience, whilst paradoxically it appears that an individual needs to experience an ‘optimum’ level of adversity in order to develop resilience. Achieving a balance of the ‘right’ amount of adversity for each individual seems an unlikely possibility in this world of change and uncertainty. With growing concern in our community about issues such as the increased prevalence of depression, the search for mechanisms that can protect people from the impact of negative life experiences will be even more important. Consequently the promotion of resilience despite likely exposure to unexpected and uncertain events is a useful goal of research, so that there are clear implications for intervention and ‘innoculation’ against adversity.

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Resilience in Response to Life Stress:

The Effects of Coping Style

and Cognitive Hardiness on the Psychological

Health of Mature Age Students.

Empirical Report

Abstract

Direct effects and buffering models were tested in relation to cognitive hardiness and coping for general health and psychological functioning. 187 mature age university students completed measures assessing life event stress and traumatic life experiences (independent variables), cognitive hardiness and coping style (moderator variables), and general health, somatization, anxiety and depression (dependent variables).

Negative life events directly affected all dependent measures, indicating support for a main effects model to explain the relationship between life stress and psychological health. Cognitive hardiness and aspects of coping style also directly impacted on measures of psychological and somatic distress. There was also support for a buffering model in which cognitive hardiness moderated the effects of adverse life events and the negative impact of emotional coping on psychological distress.

Buffering models were more common for females than males. Contrary to other findings, no significant gender differences were evident for the use of coping styles other than the avoidance-oriented coping measures of distraction-oriented and social diversion-oriented coping. Cognitive hardiness emerged as the single most important predictor of decreased scores on measures of psychological and somatic distress.

There has been increasing interest in the phenomena associated with individuals' responses in managing life's adversities. The link between adverse or stressful life events and psychological and physical health has been well established, and many studies report that stressful life events precipitate ill health and psychological dysfunction (Sarason & Sarason, 1984; Theorell & Rahe, 1971). However, how much of a direct influence adversity has on psychological or physical health is still hotly debated. Kessler, Price and Wortman (1985) report only a small direct effect of life stress on psychological and physical health, whilst others have found a significant direct effect (Clements & Turpin, 1996; Sarason, Johnson & Siegel, 1978). Despite these differences, it is clear that some individuals experience a high level of life stress without their physical or psychological health being compromised.

Rak and Paterson (1996) have advocated further study focussing on factors implicated when some resilient individuals remain competent and healthy, despite exposure to adversity (see Rutter, 1985 for a review). Rutter (1990) describes resilience as "maintaining adaptive functioning in spite of risk hazards" (p.209). Other studies (Amir & Sol, 1999; Rutter and Quinton, 1984) have reported that resilient outcomes only occur once a range of adversity has been experienced and negotiated. Both Rutter (1985) and Pellegrini (1990) state that successful engagement with adversity 'steels' individuals rather than sensitising them. Kobasa (1979) also notes that increasing levels of stress are associated with increasing opportunities, and it appears that resilient individuals are able to tap into these opportunities rather than buckle under the weight of life stress. Resilience is seen as a relative rather than an absolute resistance to adversity. An individual who is resilient through successful navigation of one adversity may not be able to repeat the process in response to another adversity: thus resilience is context dependent.

In the study of resilience, Rutter (1990) argues that it is essential to differentiate between protective factors (such as IQ or temperament) which are likely to be a given in an individual's life; and protective mechanisms (such as coping style or explanatory style) which may be developed. He argues that such protective mechanisms are generated through successful engagement with adversity, and it is the study of this successful engagement which holds promise for clinical and educational interventions. Leonard and Burns (1999) suggest that the development of protective mechanisms is associated with key turning points in an individual's life. Turning points are described as subjectively important life transitions such as marriage, death of a parent, financial changes or significant personal growth; and the negotiation of these turning points can alter developmental trajectories from risk pathways to protective ones. Two prime protective mechanisms likely to operate at these life turning points are suggested by Nowack (1989): coping style and cognitive hardiness.

Coping style

One of the factors which has a proven track record in mitigating the relationship between life stress and physical and psychological functioning is coping style (Lazarus, 1999). Lazarus and Folkman (1984) indicate that coping styles can affect how a stressful event is perceived and how it is managed. They describe coping as "all efforts to manage taxing demands, without regard to their efficacy or inherent value" (p.134). Consequently, coping is not necessarily equated with a good outcome.

However, there is a lack of agreement in the literature about categories of coping style (Endler & Parker, 1990b; Nowack, 1989). Some studies refer to escapism styles of coping as being the most deleterious to health and psychological adjustment (Proulx, Koverola, Federowicz & Kral, 1995), whilst others describe this style of coping as avoidance (Billings & Moos, 1981). Nowack (1989) states that congruence

may be found in the literature if the themes of *approach* and *avoidance* styles of coping are utilised. Commonly used terms for approach-oriented coping are task or problem-focussed coping, which refer to active attempts to deal with stress; whilst common terms for avoidance-oriented coping are escapism or emotion-focussed coping, which refer to strategies such as ruminating or emotional responses to stress (Carver, Weintraub & Scheier, 1989; Endler & Parker, 1990b). Endler and Parker (1990a) describe three main styles of coping: task-oriented coping, emotion-oriented coping and avoidance-oriented coping. Avoidance-oriented coping is further divided into distraction-oriented coping (where distraction techniques are used to cope) and social-diversion-oriented coping (where social diversions such as visiting a friend are used to cope). In terms of the themes of approach and avoidance, Endler and Parker's (1990a) task-oriented coping could be seen as approach-oriented, whilst emotion-oriented and avoidance-oriented could both be seen as avoidance-oriented.

The measurement of coping styles has also been reported as problematic, with Endler and Parker (1990a) noting problems in interpreting the widely used Ways of Coping Questionnaire (WCQ: Folkman & Lazarus, 1988). Endler and Parker criticise the WCQ for being psychometrically weak and complex to use, suggesting that factor analyses need to be undertaken with each new sample in order to obtain subscales. Endler and Parker recommend their own scale, the Coping Inventory for Stressful Situations, stating that it has good psychometric properties and robust sub-scales.

Some consistency has been reported in the literature concerning the effects of coping styles, with approach or task-focussed coping generally being associated with better outcomes (e.g. less psychological dysfunction), whilst avoidance or emotion-focussed coping is generally associated with greater psychological dysfunction (Higgins & Endler, 1995). Higgins and Endler also report gender differences in the

use of coping styles, with males using more task-oriented coping, and females more emotion-oriented and social diversion-oriented coping.

It is also clear that no single coping strategy is likely to be successful in all situations (for a review see Kessler et al., 1985). Nowack (1989) reports strong evidence that avoidance may be more effective than approach strategies in situations that are largely uncontrollable. Salient issues include the type of problem faced, at what stage of development it is faced, what degree of stress is experienced, and in what context the event occurs. For example, if pregnancy occurs as a planned event in a steady adult relationship, it is a completely different experience to an unplanned teenage pregnancy. This same event is likely to be associated with quite different levels of stress at different developmental stages. A range of coping responses are required according to context: as Rutter (1990) states, resilient individuals have a flexible range of repertoires accessible to them.

Cognitive hardiness

Like coping style, cognitive hardiness is an important variable in the life stress/psychological and physical health equation. Kobasa (1979) studied the impact of personality variables in high stress individuals in relation to illness. In particular she examined high stress individuals with a low incidence of illness, and coined the term "cognitive hardiness" to describe the features of these resilient individuals. Cognitive hardiness is made up of three factors. Firstly, cognitively hardy individuals believe that they can *control* or influence events. Secondly, they have a *commitment* to activities and their interpersonal relationships. In particular, hardy individuals have a commitment to self, in that they recognize their own distinctive values, goals and priorities in life. Lastly, they view change as a *challenge* rather than as a threat, and are predisposed to be cognitively flexible.

Kobasa (1979) and Kobasa and Puccetti (1983) describe cognitive hardiness as a personality variable, which has both cognitive and behavioural aspects. Nowack (1989) describes it as a “conceptually distinct individual coping variable” (p.148), and as a meta-construct of three relatively stable appraisals which function as a buffer in the life stress/current adjustment relationship. As a coping variable, cognitive hardiness holds some promise as a protective mechanism, which in turn holds promise for future intervention to boost resilient outcomes.

Cognitive hardiness was found to mitigate the negative effects of stress in relation to illness (Kobasa, 1979), and psychological dysfunction as measured by depression (Nowack, 1989). In a study of older people (65-80 years), Sharpley and Yardley (1999) report that cognitive hardiness was a strong predictor on a depression-happiness measure, in that participants high in cognitive hardiness scored higher on the happiness end of the continuum.

Main and moderator effects models

Just how variables such as coping style and cognitive hardiness impact on the stress/health relationship has also been an issue in the literature, and two major models have been proposed to elucidate this. These are the main (or direct) effects model and the moderator (or stress buffer) model (Aldwin & Revenson, 1987; Wilkinson, Walford & Espnes, 2000). The main effects model predicts that a variable (such as coping style) has direct and uniform effects on mental health, irrespective of the levels of adversity experienced. The moderator model proposes that a variable such as effective coping buffers an individual against the effects of negative life events or stress, in an interactive process. (See Figure 1 for further explanation).

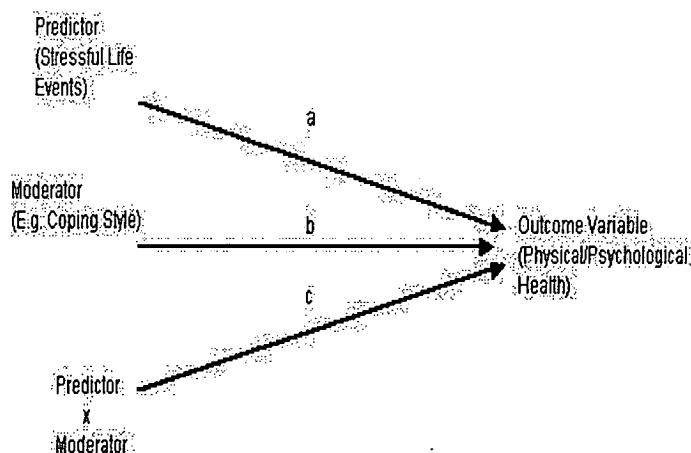


Figure 1. Moderator model (Baron & Kenny, 1986).

Note. *a* might refer to negative life events, *b* might refer to the direct effects of a variable such as coping style, and *c* refers to the interaction of these two such that the product *ab* buffers the outcome, usually operationalised as reduced scores on psychological distress measures.

In terms of coping, Wilkinson et al. (2000) found direct effects for both approach and avoidant coping, but no buffer effects. Higgins & Endler (1995) found that emotion-oriented coping had direct effects (positively predicting distress), but no buffer effects. Aldwin & Revenson (1987) report direct effects for task-oriented coping, with high levels of task-oriented coping reducing mental health dysfunction. They also report buffer effects, with high levels of task-oriented coping mitigating the effects of adversity on mental health.

Studies have reported main effects for cognitive hardiness, with high cognitive hardiness scores related to increased happiness and lowered psychological distress (Nowack, 1989; Sharpley & Yardley, 1999), but little has been reported concerning the potential buffering effects cognitive hardiness may have on the stress/health relationship.

Measurement issues: Stress, psychological and physical health

Two factors which confound interpretations of the literature concerning life stress and health outcomes are the measurement of life stress and varying operationalisations of psychological and physical health.

A range of approaches have been taken in the measurement of life stress, including the measurement of traumatic incidents (Herman, 1997) and life event stress (Sarason et al., 1978). Traumatic events have been implicated as affecting current health and psychological functioning, particularly in relation to PTSD symptomatology (Bernat, Ronfeldt, Calhoun & Arias, 1998). It has been argued that traumatic events are recalled more reliably than adverse life events, as they are more likely to be recalled as 'flashbulb' memories of unusual vividness and memorability (Vrana & Lauterbach, 1994). Traumatic events are also thought to be cumulative in their deleterious effect on an individual over time, and are usually measured over a person's lifetime (Herman, 1997). However, the effect of traumatic events has been notoriously difficult to measure accurately, as it is the subjective impact of the event on the individual that matters, rather than the event itself (Krinsley & Weathers, 1995). Goodman, Corcoran, Turner, Yuan and Green (1998) have developed the Stressful Life Events Screening Questionnaire (SLESQ) which both counts the number of traumatic events and allows for their subjective impact to be taken into account.

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problems, biases in hindsight, distortion and under-reporting of events (Vrana & Lauterbach, 1994; Zimmerman, 1983). Furthermore, an event such as the death of a close family member is likely to have a more detrimental effect for someone than an outstanding personal achievement, yet in Holmes and Rahe's (1967) scale, both are summed in the same direction.

Sarason et al. (1978) regard life stress in terms of its negative impact, and propose a measure (the Life Experiences Survey) in which participants ascribe their own weightings to life events experienced in the past 12 months. Higgins and Endler (1995) also report that only events which subjects rated as negative were related to outcome measures of distress. Clements and Turpin (1996) note that accurate recall occurs only when life events have occurred in the recent past, and suggest that 12 months is the optimum time period for measurement of life stress. This time frame has been adopted in most life stress measures (Clements & Turpin, 1996; Holmes & Rahe, 1967; Sarason et al., 1978).

As with life stress measures, a number of different methods have been used to measure psychological and physical health. Wilkinson et al. (2000) argue that measures of both well-being and distress should be used, as they denote oblique dimensions of psychological health. Distress may be operationalised as depression, anxiety and negative affect measures, whilst well-being may be operationalised through happiness, life satisfaction and positive affect scales (Headey & Wearing, 1992). Endler and Parker (1990b) and Higgins and Endler (1995) utilise measures of psychological and somatic distress, and recommend that measures of anxiety, depression and somatic symptoms are central in the assessment of psychological and physical health.

Others have measured resilient outcomes in terms of behavioural indices of competence, such as scholastic success, adaptive behaviour or the lack of psychopathology (Rutter & Quinton, 1984). These approaches have been criticised by Luthar (1991) and Luthar and Zigler (1991), who argue that it is quite possible that an individual is deemed behaviourally competent, yet may have psychological difficulties such as depression or anxiety. Werner's (1989, 1993) 30-year longitudinal study of resilient individuals also indicated that not all of those who could be labelled as resilient (coping successfully with adult responsibilities) were happy or satisfied with their lives. Consequently measures of psychological distress appear to be most salient.

The present study

In summary, the literature concerning the relationship between negative life events, direct and buffering variables and current psychological functioning has been equivocal. Whilst coping style has been reported as directly affecting outcome measures such as psychological functioning, its role in buffering an individual against the effects of negative life events has not been consistently documented. Similarly, cognitive hardiness has been studied in terms of its main effects on psychological functioning, but less has been reported concerning its possible buffering role. Nowack (1989) suggests focussing on these two factors together. Furthermore, the key role of turning points in individual's lives (Leonard & Burns, 1999) suggests studying a mature age population where these turning points are likely to have occurred. Further limitations identified in the literature include inconsistent measurement of life stress and poorly constructed outcome measures of psychological functioning.

On these bases, this study tests the main or direct effects model and the interaction or buffering model in examining the influence of negative life events, coping style and cognitive hardiness on measures of psychological health.

The expectations guiding this study are as follows. First, as the numbers of negative life events or traumatic events (life stress) experienced increase, psychological and somatic distress will also increase. Second, coping style and cognitive hardiness will have both main and interaction effects in relation to life stress and measures of psychological functioning.

In terms of coping style, it is predicted that task-oriented coping will have a direct effect on the relationship between life stress and current psychological functioning, in that irrespective of levels of life stress, high levels of task-oriented coping will result in lower levels of psychological distress. Task-oriented coping is also expected to have a moderating effect, in that at high levels of life stress, high scores on task-oriented coping will result in lower levels of psychological distress. Emotion-oriented coping is expected to have a direct effect in elevating levels of psychological and somatic distress, and consequently no buffering effects are predicted for this measure. No firm expectations are held for the effects of distraction-oriented and social diversion-oriented coping. Gender differences are predicted, in that males will utilise task-oriented coping more often, and main and interaction effects are expected, as outlined above. Females are expected to use emotion-oriented coping more than males, with main effects expected in terms of elevated levels of psychological distress.

Cognitive hardiness is expected to have a direct effect on the relationship between life stress and current psychological functioning, in that irrespective of levels of life stress, high levels of cognitive hardiness will result in lower levels of psychological

distress. Cognitive hardiness is also expected to have a moderating effect, in that at high levels of life stress, high cognitive hardiness scores will result in lower levels of psychological distress. No firm expectations are held concerning gender differences with cognitive hardiness.

Method

Participants

This cross-sectional study involved 187 mature age (25 years and over) undergraduate and postgraduate students studying at the University of Tasmania. ($N = 81$ males, $N = 106$ females). Participants were all volunteers recruited via posters and flyers inviting participation, through a postgraduate email list server, and through in-person invitations to participate delivered in classes. A mature age student volunteered her time to invite participation from other mature age students in her network, and two presidents of the postgraduate association assisted via requesting participation on a postgraduate email list server.

Participants' ages ranged from 25-59 ($M = 38.05$, $SD = 9.63$). 44 % of participants were undergraduate, with 56% postgraduate; and 40% were full time students, with 60% part-time. Number of years in tertiary education ranged from 1-18 ($M = 5.65$, $SD = 3.16$).

Measures

This study has two independent variables, life event stress and traumatic life experiences. Moderator variables are coping style and cognitive hardiness, and the four dependent variables are general health, anxiety, depression and somatization. These variables were measured through a series of six self-report questionnaires, described below.

Independent variable measures

The Life Experiences Survey (LES). The LES (Sarason et al., 1978) was used to measure life stress. This 57-item questionnaire covers events of the past year, and utilises a 7-point Likert-type scale with end-point designations ‘extremely positive’ (+3) to ‘extremely negative’ (−3). Three items were deleted, as they were not applicable to an Australian population (e.g., “Joining a fraternity/sorority”). Sample items are: *marriage, death of friend or relative, serious illness of self or family member, academic probation, and failing a subject*. Minor changes in wording were made to make this scale more applicable for an Australian population. Summing positive scores created a positive change score, whilst the same process for negative scores created a negative change score. Reported test-retest correlations for positive change scores are .19 and .53, and are more consistent for negative change scores (.56 and .88), and for the total score (.63 and .64) (Sarason et al., 1978).

The Stressful Life Events Screening Questionnaire (SLESQ). The SLESQ (Goodman et al., 1998) was used to measure traumatic incidents. This 15-item questionnaire asks respondents to indicate whether a range of traumatic events have occurred at any time in their entire life, including early childhood. The SLESQ is designed to identify Criterion A events usually associated with PTSD, (as outlined by DSM IV) and to minimise sub-threshold events. It asks participants if they have ever experienced a range of events classed as traumatic, such as: *Were you ever in a life-threatening accident?, Was physical force or a weapon ever used against you in a robbery or mugging?* These questions are followed up by questions seeking further detail to assist the scorer to gauge whether the events can be rated as traumatic. For example, *Were you hospitalised overnight?, Was your life in danger?* Questions concerning sexual assault are behaviourally specific, and avoid the use of broad terms

such as rape. The SLESQ has good test-retest reliability (.89), and good convergent reliability (.77). Scoring is simply a summing of items which meet with Criterion A thresholds.

Moderator variable measures

The Coping Inventory for Stressful Situations (CISS). The CISS (Endler & Parker, 1990a) was used to measure coping styles. It has 48 items which are rated on a 5 point Likert-type scale, with end-point designations 'Not at all' (1) to 'Very much' (5). Sixteen items load on three basic subscales, which are Task-oriented, Emotion-oriented, and Avoidance-oriented coping. The Avoidance-oriented scale divides into two further subscales: Distraction (8 items) and Social Diversion (5 items). Sample items include: *Focus on the problem and see how I can solve it* (Task-oriented), *Become very upset* (Emotion-oriented), *Treat myself to a favourite food or snack* (Avoidance-oriented). Internal consistencies from .72 to .91 are reported, whilst test-retest reliabilities are reported as moderate to high, with task-oriented and emotion-oriented subscales having the highest reliabilities, above or equal to .68 for males and females. Scores are summed across each of the subscales, including distraction and social diversion.

The Cognitive Hardiness Scale (CHS). The CHS (Nowack, 1990) was used to measure cognitive hardiness. This scale derives from Kobasa's (1979) dimensions of Commitment, Control and Challenge. The CHS has 30 items, and following Sharpley & Yardley (1999), 2 items related specifically to work as present employment were deleted, as they were deemed not relevant for a student population. Items tap personal beliefs about life, and are rated on a 5 point scale, with end-point designations 'Strongly agree' (1) to 'Strongly disagree' (5). Items relate to issues of

- 1) Involvement or commitment to one's family, self, hobbies;
- 2) Challenge: attitudes

around viewing life changes as challenges as opposed to threats, and 3) Control: beliefs that one has a sense of control over outcomes in life. Sample items include: *My involvement in non-work activities and hobbies provide me with a sense of meaning and purpose* (Commitment), and *In general, I would prefer to have things well planned out in advance rather than deal with the unknown* (Control). Internal consistency was reported by Nowack (1990) to be .83. As several items were reversed, scoring was completed such that high scores indicated high cognitive hardiness.

Dependent variable measures

The General Health Questionnaire (GHQ). The GHQ (Goldberg & Hillier, 1979) is a 28-item scale designed as a general measure of health and psychopathology. Goldberg and Williams (1991) describe a range of scoring methods, and in this study a 4-point Likert-type scale with end-point designations of 'Not at all' (1) to 'Much more than usual' (4) was used. Consequently the higher the score, the more symptoms an individual is experiencing. The GHQ measures symptomatology across four factors: somatic symptoms, anxiety and insomnia, social dysfunction and severe depression. Sample items are: *Have you recently felt that you are ill?* (Somatic), *Have you recently lost much sleep over worry?* (Anxiety and insomnia), *Have you recently felt that you played a useful part in things?* (Social dysfunction), and *Have you recently felt that life isn't worth living?* (Severe depression). These four factors can be utilised as sub-scales, but for this study, the total GHQ score was used. Goldberg and Williams (1991) report validity coefficients ranging from .32 to .70 for each of the four subscales, with somatic symptoms recording the lowest. They also report a test-retest correlation of .90.

The SCL90- R. Three subscales of the SCL90-R (Derogatis, 1983) were used. They are the 12-item Somatization subscale (SCL-Somat), the 13-item Depression subscale (SCL-Dep) and the 10-item Anxiety subscale (SCL-Anx). A 5-point Likert-type scale is used, with end-point designations of 'Not at all' (0) to 'Extremely' (4). A subject's score for these three subscales is the sum of the ratings on all items. Items all relate to 'How much that problem has distressed or bothered you during the past 7 days, including today.' Sample items are: *How much were you distressed by headaches?* (Somatization), *How much were you distressed by feeling low in energy or slowed down?* (Depression), *How much were you distressed by nervousness or shakiness inside?* (Anxiety). Derogatis (1983) reported internal consistency coefficients of .85 to .90, and test-retest correlations of .80 to .86.

Procedure

All those who participated read an information sheet which indicated that participation was voluntary (Appendix A), and consent was implied via completion and return of the surveys. Participants completed a series of questionnaires consisting of a number of self-report measures, which were completed in the participants' own time and space. Return of questionnaires was facilitated through provision of reply paid envelopes.

Results

Analysis strategy

In the first stage of each analysis the dependent measure of psychological distress was regressed on the score for adverse life events. This will be called the Life Events Model. The dependent measures used were the General Health Questionnaire (GHQ), and the depression, anxiety and somatization subscales of the SCL-90-R.

Following the recommendation of Jaccard, Turrisi and Wan (1990), each of the predictor variables was centred by subtracting the mean from each score.

In the second stage stepwise multiple regression was used to identify measures which made a significant additional contribution to the prediction of a dependent measure after allowing for the effect of the measure of adverse life events. The measures tested for inclusion were coping (task-oriented, emotion-oriented, distraction-oriented and social diversion-oriented) and cognitive hardiness. The resulting model will be called the Main Effects Model. As high scores on all dependent variables indicate high psychological distress, an increase in the level of an explanatory variable with a positive regression coefficient tends to increase psychological distress, while an increase in one with a negative coefficient tends to reduce it (assuming a causal interpretation).

- In the third stage of the analysis, the significant explanatory variables identified at stage two, together with negative life events as measured by the Life Experiences Survey, were combined in all possible multiplicative combinations to assess interaction effects. The significant individual explanatory measures from stage 2 were then entered at step one of the analysis, and a stepwise procedure with a p value for entry of .05 was then used to identify and enter into the regression equation any of the interactions which made significant additional contributions to the prediction of the dependent measure. The resulting model will be called the Interaction Model. An interaction model may be regarded as a buffering model provided there is an interaction term which includes the product of a risk variable positively related to the measure of psychological distress (e.g. adverse life events), and a moderator variable not positively related to psychological distress (e.g. cognitive hardiness), and the interaction term has a significant negative regression coefficient. Because of the

negative regression coefficient, at high levels of the variables in the interaction the product will subtract from the measure of psychological distress, thereby reducing it. The magnitude of the interaction effect may be assessed by the change in R^2 .

The presence of a significant interaction may be determined either by an F test for R^2 change when the interaction term is included, or by a t test which assesses the null hypothesis that the coefficient of the interaction term is zero. As noted by Jaccard, Turrisi and Wan (1990, p.22), these tests are equivalent with $F = t^2$, and they yield identical p values.

When using a stepwise procedure, terms which were significant at an earlier stage may cease to be significant, as shown by a t test of the null hypothesis that its coefficient is equal to zero within the final prediction equation.

It should also be noted that in the reporting of these results, some degree of causality is assumed, based on the premise that coping and cognitive hardiness variables may moderate the effects of negative life stress on psychological functioning. Strictly speaking, causality is not demonstrated in the present study as the data are correlational. However, given that moderator effects are present in these results, the assumption of causality is consistent with the literature which argues that coping buffers stressful life events (e.g., Lazarus, 1999).

Gender differences

Possible gender differences for the various scales were assessed using two-tailed t -tests with a significance level of $p = .05$. There were no significant differences in mean scores, except for distraction-oriented coping and social diversion-oriented coping, where women scored higher than men on both subscales. See Table 1 for gender comparisons.

Table 1

Summary of *t* Tests Across Gender for all Measures (N = 106 for Women, N = 81 for Men)

Measure	Gender	Mean	Std.Deviation	<i>t</i>
LES pos	Male	8.95	9.08	1.11
	Female	7.58	7.8	
LES neg	Male	7.84	7.4	-0.22
	Female	8.08	6.96	
SLESQ	Male	2.23	1.96	1.21
	Female	1.88	1.93	
Taskcope	Male	57.79	10.14	0.86
	Female	56.34	12.3	
Emotcope	Male	37.41	12.77	-1.55
	Female	40.24	12.08	
Distract	Male	22.89	6.72	-2.18 *
	Female	25.05	6.68	
Social	Male	15.14	4.25	-3.61 **
	Female	17.7	5.21	
Coghard	Male	99.49	11.2	0.65
	Female	98.3	13.31	
GHQ	Male	47.47	11.44	-0.81
	Female	48.79	10.85	
SCL Somat	Male	6.09	5.89	0.01
	Female	6.08	6.11	
SCL dep	Male	9.58	10.29	-0.43
	Female	10.22	9.99	
SCL Anx	Male	4.58	5.64	-0.13
	Female	4.69	5.86	

Note. *LES pos* refers to positive life events and *LES neg* refers to negative life events, both as measured by the LES; *Taskcope* refers to task-oriented coping, *Emotcope* refers to emotion-oriented coping, *Distract* refers to distraction-oriented coping and *Social* refers to social diversion-oriented coping, all as measured by the CISS; *Coghard* refers to cognitive hardiness as measured by the CHS; *GHQ* refers to the General Health Questionnaire; *SCL Somat* refers to the Somatization scale of the SCL90-R, *SCL Dep* refers to the Depression scale of the SCL90-R and *SCL Anx* refers to the Anxiety scale of the SCL90-R.

p* < .05, *p* < .01

Results for Females

The results of the regression analyses predicting GHQ score from coping scales and cognitive hardiness after allowing for the effect of negative life events are shown in Table 2.

Table 2
Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting GHQ Score for Females (N = 106)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	48.67	.97			
LES neg	.66	.14	.43**	4.76	103
<i>Main Effects Model</i>					
(Constant)	47.63	.83			
LES neg	.52	.12	.34**	4.42	101
Emotcope	.27	.08	.30**	3.23	101
Coghard	-.22	.08	-.27**	-2.83	101
<i>Interaction Model</i>					
(Constant)	47.38	.82			
LES neg	.45	.12	.29**	3.82	100
Emotcope	.27	.08	.30**	3.30	100
Coghard	-.18	.08	-.22*	-2.38	100
LES neg x Coghard	-.018	.007	-.21*	-2.64	100

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Emotcope* refers to emotion-oriented coping as measured by the CISS, and *Coghard* refers to cognitive hardiness as measured by the CHS.

Note 2. For the Life Events Model, $R^2 = .18^{**}$, $F(1,103) = 22.66$; when emotion-oriented coping is added at Step 2, $R^2 = .39^{**}$, $\Delta R^2 = .21^{**}$, $F_{ch.}(1,102) = 35.30$; when cognitive hardiness is added at Step 3, $R^2 = .44^{**}$, $\Delta R^2 = .05^{**}$, $F_{ch.}(1,101) = 8.03$; when the interaction of negative life events and cognitive hardiness is added at Step 4, $R^2 = .47^{**}$, $\Delta R^2 = .04^*$, $F_{ch.}(1,100) = 6.98$.

* $p < .05$, ** $p < .01$

Initially negative life events were found to be a significant predictor of GHQ, accounting for 18% of the variance. There were also significant main effects of emotion-oriented coping and cognitive hardiness in the prediction of GHQ, which together accounted for another 26% of the variance. As expected, higher scores in emotion-oriented coping tend to directly elevate GHQ, whilst high scores in cognitive hardiness tend to reduce GHQ scores.

The stepwise procedure identified the negative life events x cognitive hardiness interaction as a buffer effect, as it made a significant additional contribution in accounting for a further 4% of the variance of GHQ. The interaction model had an

overall R^2 of .47, which accounts for a substantial proportion of the variation of GHQ.

The coefficient of the interaction term is negative, and it may be interpreted as indicating that high scores in cognitive hardiness moderate the effects of high levels of negative life events by reducing their impact on GHQ.

Table 3 shows the results of the regression analyses predicting SCL Depression from the coping scales and cognitive hardiness, after allowing for the effect of negative life events.

Table 3
Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting SCL Depression (SCL-Dep) Score for Females (N = 106)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	10.01	.88			
LES neg	.65	.13	.46**	5.15	101
<i>Main Effects Model</i>					
(Constant)	8.90	.70			
LES neg	.50	.10	.35**	5.04	99
Coghard	-.25	.07	-.33**	-3.85	99
Emotcope	.27	.07	.32**	3.67	99
<i>Interaction Model</i>					
(Constant)	8.04	.78			
LES neg	.47	.10	.33**	4.78	98
Coghard	-.18	.07	-.24*	-2.61	98
Emotcope	.24	.07	.29**	3.38	98
Emotcope x Coghard	-.011	.005	-.20*	-2.38	98

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Coghard* refers to cognitive hardiness as measured by the CHS, and *Emotcope* refers to emotion-oriented coping as measured by the CISS.

Note 2. For the Life Events Model, $R^2 = .21^{**}$, $F(1,101) = 26.56$; when cognitive hardiness is added at Step 2, $R^2 = .47^{**}$, $\Delta R^2 = .26^{**}$, $F_{ch}(1,100) = 49.72$; when emotion-oriented coping is added at Step 3, $R^2 = .54^{**}$, $\Delta R^2 = .06^{**}$, $F_{ch}(1,99) = 13.49$; when the interaction of emotion-oriented coping and cognitive hardiness is added at Step 4, $R^2 = .56^{**}$, $\Delta R^2 = .03^*$, $F_{ch}(1,98) = 5.64$.

* $p < .05$, ** $p < .01$

Again, negative life events were found to be a significant predictor of SCL Depression, accounting for 21% of the variance. There were also significant main effects of cognitive hardiness and emotion-oriented coping in the prediction of SCL

Depression, which together accounted for another 32% of the variance. As with the GHQ, higher scores in emotion-oriented coping appear to directly elevate SCL Depression, whilst high scores in cognitive hardiness tend to reduce SCL Depression scores.

The stepwise procedure identified another buffer effect interaction between emotion-oriented coping and cognitive hardiness, as it made a significant additional contribution in accounting for a further 3% of the variance of SCL Depression scores. The interaction model had an overall R^2 of .56, which accounts for a substantial proportion of the variation of SCL Depression. Cognitive hardiness appears to moderate the direct effect of emotion-oriented coping on SCL Depression scores by reducing its impact on this measure of depression.

Table 4 shows the results of the regression analyses predicting SCL Anxiety from the coping scales and cognitive hardiness, after allowing for the effect of negative life events.

Table 4

Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting SCL Anxiety (SCL-Anx) Scores for Females (N = 106)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	4.60	.54			
LES neg	.31	.08	.37**	3.95	101
<i>Main Effects Model</i>					
(Constant)	4.05	.49			
LES neg	.24	.07	.28**	3.41	99
Emotcope	.14	.05	.28**	2.76	99
Coghard	-.11	.05	-.25*	-2.46	99
<i>Interaction Model</i>					
(Constant)	3.38	.52			
LES neg	.10	.08	.12	1.28	97
Emotcope	.12	.05	.24*	2.44	97
Coghard	-.05	.05	-.12	-1.11	97
Emotcope x Coghard	-.007	.003	-.21*	-2.19	97
LES neg x Emotcope x Coghard	-.0007	.000	-.25*	-2.51	97

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Emotcope* refers to emotion-oriented coping as measured by the CISS, and *Coghard* refers to cognitive hardiness as measured by the CHS.

Note 2. For the Life Events Model, $R^2 = .13^{**}$, $F(1,101) = 15.56$; when emotion-oriented coping is added at Step 2, $R^2 = .31^{**}$, $\Delta R^2 = .18^{**}$, $F_{ch.}(1,100) = 26.09$; when cognitive hardiness is added at Step 3, $R^2 = .35^{**}$, $\Delta R^2 = .04^*$, $F_{ch.}(1,99) = 6.06$; when the interaction of emotion-oriented coping and cognitive hardiness is added at Step 4, $R^2 = .40^{**}$, $\Delta R^2 = .05^{**}$, $F_{ch.}(1,98) = 7.63$; when the interaction of negative life events, emotion-oriented coping and cognitive hardiness is added at Step 5, $R^2 = .44^{**}$, $\Delta R^2 = .04^*$, $F_{ch.}(1,97) = 6.23$.

* $p < .05$, ** $p < .01$

Negative life events were once again found to be a significant predictor of SCL Anxiety, accounting for 13% of the variance. There were also significant main effects of emotion-oriented coping and cognitive hardiness in the prediction of SCL Anxiety, which together accounted for another 22% of the variance. Higher cognitive hardiness scores tended to reduce SCL Anxiety scores, whilst high scores in emotion-oriented coping had the opposite effect on SCL Anxiety.

The stepwise procedure identified two significant interactions, both of which represent buffer effects. The emotion-oriented coping x cognitive hardiness interaction accounted for another 5% of the variance in SCL Anxiety scores, and indicates that high scores in cognitive hardiness tend to moderate the effects of high levels of emotion-oriented coping by reducing its impact on SCL Anxiety. Second, the three factor interaction of negative life events x emotion-oriented coping x cognitive hardiness accounted for another 4% of the variance in SCL Anxiety scores, and may be interpreted as indicating that cognitive hardiness mitigates the combined effect of high levels of emotional coping and adverse life events. That is, high scores in cognitive hardiness appear to reduce the impact of a high level of emotion-oriented coping when it is combined with a high level of adverse life events. The interaction model had an overall R^2 of .44, which accounts for a substantial proportion of the variation of SCL Anxiety.

The results of the regression analyses predicting SCL Somatization from coping scales and cognitive hardiness after allowance for the effect of negative life events are shown in Table 5.

Table 5

Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting SCL Somatization (SCL-Somat) Scores for Females (N = 106)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	6.04	.59			
LES neg	.19	.09	.21*	2.18	101
<i>Main Effects Model</i>					
(Constant)	6.02	.59			
LES neg	.14	.08	.16	1.79	99
Emotcope	.18	.05	.34**	3.65	99
Distract	-.22	.08	-.24*	-2.64	99

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Emotcope* refers to emotion-oriented coping as measured by the CISS, and *Distract* refers to distraction-oriented coping as measured by the CISS.

Note 2. For the Life Events Model, $R^2 = .05^*$, $F(1,101) = 4.75$; when emotion-oriented coping is added at Step 2, $R^2 = .13^*$, $\Delta R^2 = .09^{**}$, $F_{ch.}(1,100) = 9.73$; when distraction-oriented coping is added at Step 3, $R^2 = .19^*$, $\Delta R^2 = .06^*$, $F_{ch.}(1,99) = 6.95$.

* $p < .05$, ** $p < .01$

Negative life events were once again found to be a significant predictor of SCL Somatization, accounting for 5% of the variance. There were also significant main effects of emotion-oriented coping and distraction-oriented coping in the prediction of SCL Somatization, which together accounted for another 15% of the variance. As expected, higher scores in emotion-oriented coping appear to directly elevate SCL Somatization. High scores in distraction-oriented coping tend to reduce SCL Somatization scores. The stepwise procedure did not identify any additional interactions, and the overall R^2 for the main effects model was only .19.

Results for Males

The results of the regression analyses predicting GHQ score from coping scales and cognitive hardiness after allowance for the effect of negative life events are shown in Table 6.

Table 6

Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting GHQ Score for Males (N = 81)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	47.47	1.17			
LES neg	.63	.16	.41**	3.99	79
<i>Main Effects Model</i>					
(Constant)	47.47	.93			
LES neg	.23	.14	.15	1.66	77
Coghard	-.62	.09	-.61**	-6.76	77
Social	.44	.22	.16*	1.99	77

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Coghard* refers to cognitive hardiness as measured by the CHS, and *Social* refers to social diversion-oriented coping as measured by the CISS.

Note 2. For the Life Events Model, $R^2 = .17^{**}$, $F(1,79) = 15.88$; when emotion-oriented coping is added at Step 2, $R^2 = .46^{**}$, $\Delta R^2 = .29^{**}$, $F_{ch}(1,78) = 42.38$; when social diversion-oriented coping is added at Step 3, $R^2 = .49^{**}$, $\Delta R^2 = .03^*$, $F_{ch}(1,77) = 3.98$.

* $p < .05$, ** $p < .01$

Negative life events remained a significant predictor of GHQ, accounting for 17% of the variance. There were also significant main effects of cognitive hardiness and social diversion-oriented coping in the prediction of GHQ, which together accounted for another 32% of the variance. As with the females, high scores in cognitive hardiness tend to reduce GHQ scores. In addition, higher scores in social diversion-oriented coping appear to directly elevate GHQ. The stepwise procedure did not identify any additional interaction effects, and the overall R^2 for the main effects model was .49.

Table 7 shows the results of the regression analyses predicting SCL Depression from the coping scales and cognitive hardiness, after allowing for the effect of negative life events.

Table 7

Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting SCL Depression (SCL-Dep) Score for Males (N = 81)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	9.58	1.06			
LES neg	.55	.14	.39**	3.80	79
<i>Main Effects Model</i>					
(Constant)	9.58	.84			
LES neg	.16	.13	.12	1.30	77
Coghard	-.45	.10	-.49**	-4.67	77
Emotcope	.17	.08	.21*	2.12	77
<i>Interaction Model</i>					
(Constant)	8.21	.87			
LES neg	.34	.12	.25**	2.76	75
Coghard	-.42	.09	-.45*	-4.78	75
Emotcope	.17	.07	.21*	2.32	75
Emotcope x Coghard	-.018	.005	-.25**	-3.27	75
LES neg x Emotcope	.002	.001	.25**	2.92	75
x Coghard					

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Coghard* refers to cognitive hardiness as measured by the CHS, and *Emotcope* refers to emotion-oriented coping as measured by the CISS.

Note 2. For the Life Events Model, $R^2 = .15^{**}$, $F(1,79) = 14.41$; when cognitive hardiness is added at Step 2, $R^2 = .46^{**}$, $\Delta R^2 = .30^{**}$, $F_{ch}(1,78) = 43.56$; when emotion-oriented coping is added at Step 3, $R^2 = .49^{**}$, $\Delta R^2 = .03^*$, $F_{ch}(1,77) = 4.47$; when the interaction of emotion-oriented coping and cognitive hardiness is added at Step 4, $R^2 = .56^{**}$, $\Delta R^2 = .07^{**}$, $F_{ch}(1,76) = 11.66$; when the interaction of negative life events, emotion-oriented coping and cognitive hardiness is added at Step 5, $R^2 = .60^{**}$, $\Delta R^2 = .05^{**}$, $F_{ch}(1,75) = 8.54$.

* $p < .05$, ** $p < .01$

Again, negative life events was found to be a significant predictor of SCL Depression, accounting for 15% of the variance. There were also significant main effects of cognitive hardiness and emotion-oriented coping in the prediction of SCL Depression, which together accounted for another 33% of the variance. Higher scores in emotion-oriented coping appear to directly elevate SCL Depression, whilst high scores in cognitive hardiness tend to reduce SCL Depression scores.

The stepwise procedure identified two significant interactions. The emotion-oriented coping x cognitive hardiness interaction reflects a buffer effect. This interaction accounted for another 7% of the variance in SCL Depression scores, indicating that high scores in cognitive hardiness tend to moderate the effects of high levels of emotion-oriented coping by reducing its impact on SCL Depression. Second, the three factor interaction of negative life events x emotion-oriented coping x cognitive hardiness accounted for another 5% of the variance in SCL Depression scores, and does not represent a buffer effect. This interaction could be interpreted as implying that with high levels of negative life events, the reduction in SCL Depression caused by the emotion-oriented coping x cognitive hardiness interaction is not as great. The interaction model had an overall R^2 of .60, which accounts for a substantial proportion of the variation of SCL Depression.

Table 8 shows the results of the regression analyses predicting SCL Anxiety from the coping scales and cognitive hardiness, after allowing for the effect of negative life events.

Table 8

Summary of Hierarchical and Stepwise Regression Analysis for Measures Predicting SCL Anxiety (SCL-Anx) Scores for Males (N = 81)

Measure	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>df</i>
<i>Life Events Model</i>					
(Constant)	4.58	.61			
LES neg	.19	.08	.25*	2.25	79
<i>Main Effects Model</i>					
(Constant)	4.58	.50			
LES neg	.04	.08	.05	.47	77
Coghard	-.23	.06	-.45**	-4.18	77
Taskcope	-.14	.06	-.26*	-2.62	77
<i>Interaction Model</i>					
(Constant)	4.10	.51			
LES neg	.08	.07	.10	1.06	76
Coghard	-.20	.05	-.40**	-3.77	76
Taskcope	-.12	.05	-.21*	-2.18	76
Coghard x Taskcope	.011	.004	.27**	2.91	76

Note 1. *LES neg* refers to negative life events, as measured by the LES, *Coghard* refers to cognitive hardiness as measured by the CHS, and *Taskcope* refers to task-oriented coping as measured by the CISS.

Note 2. For the Life Events Model, $R^2 = .06^*$, $F(1,79) = 5.06$; when cognitive hardiness is added at Step 2, $R^2 = .33^*$, $\Delta R^2 = .27^{**}$, $F_{ch.}(1,78) = 31.39$; when task-oriented coping is added at Step 3, $R^2 = .39^*$, $\Delta R^2 = .06^*$, $F_{ch.}(1,77) = 6.86$; when the interaction of cognitive hardiness and task-oriented coping is added at Step 4, $R^2 = .45^*$, $\Delta R^2 = .06^{**}$, $F_{ch.}(1,76) = 8.49$.

* $p < .05$, ** $p < .01$

Negative life events remained a significant predictor of SCL Anxiety, accounting for 6% of the variance. There were also significant main effects of cognitive hardiness and task-oriented coping in the prediction of SCL Anxiety, which together accounted for another 33% of the variance. Higher cognitive hardiness scores tend to reduce SCL Anxiety scores, and as predicted, high scores in task-oriented coping also tend to reduce SCL Anxiety scores.

The stepwise procedure identified only one significant interaction, which does not represent a buffer effect. The cognitive hardiness x task-oriented coping interaction accounted for another 6% of the variance of SCL Anxiety, indicating that the effect of

the interaction of these two variables diminishes their direct effects at high levels of both of them, so their individual effects are not additive.

The results of the regression analyses predicting SCL Somatization from coping scales and cognitive hardiness after allowance for the effect of negative life events are shown in Table 9.

Table 9
Summary of Hierarchical and Stepwise Regression Analysis for Variables Predicting SCL Somatization (SCL-Somat) Scores for Males (N = 81)

Measure	B	SE B	β	t	df
<i>Life Events Model</i>					
(Constant)	6.09	.58			
LES neg	.37	.08	.47**	4.67	79
<i>Main Effects Model</i>					
(Constant)	6.09	.54			
LES neg	.24	.08	.30**	2.97	78
Coghard	-.21	.05	-.39**	-3.91	78

Note 1. *LES neg* refers to negative life events, as measured by the LES, and *Coghard* refers to cognitive hardiness as measured by the CHS.
Note 2. For the Life Events Model, $R^2 = .22^{**}$, $F(1,79) = 21.77$; when cognitive hardiness is added at Step 2, $R^2 = .34^{**}$, $\Delta R^2 = .13^{**}$, $F_{ch.}(1,78) = 15.25$.
* $p < .05$, ** $p < .01$

Negative life events was found to be a significant predictor of SCL Somatization, accounting for 22% of the variance. There was also one significant main effect in the prediction of SCL Somatization, with cognitive hardiness accounting for another 13% of the variance. Once again, higher cognitive hardiness scores tend to reduce SCL Somatization scores, and the overall R^2 for the main effects model was .34. The stepwise procedure did not identify any additional interactions: hence there were direct effects only when utilising the dependent variable of SCL Somatization.

The summary of main and interaction effects for all dependent measures for males and females is shown in Table 10. The Life Events Model indicates that with every

dependent measure, negative life events was a significant predictor of psychological distress.

Table 10

Summary of Significant Main and Interaction Effects on all Outcome Measures. (N = 106 for Women, N = 81 for Men)

Dependent Measure	Gender	Main Effects	Interaction Effects
GHQ	Female	LES neg (+) Emotcope (+) Coghard (-)	(LES neg x Coghard) (-)*
SCL Dep	Female	LES neg (+) Emotcope (+) Coghard (-)	(Emotcope x Coghard) (-)*
SCL Anx	Female	LES neg (+) Emotcope (+) Coghard (-)	(Emotcope x Coghard) (-)* (LES neg x Emotcope x Coghard) (-)*
SCL Somat	Female	LES neg (+) Emotcope (+) Distract (-)	Nil
GHQ	Male	LES neg (+) Coghard (-) Social (+)	Nil
SCL Dep	Male	LES neg (+) Coghard (-) Emotcope (+)	(Emotcope x Coghard) (-)* (LES neg x Emotcope x Coghard) (+)
SCL Anx	Male	LES neg (+) Coghard (-) Taskcope (-)	(Coghard x Taskcope) (+)
SCL Somat	Male	LES neg (+) Coghard (-)	Nil

Note. *LES neg* refers to negative life events as measured by the LES; *Taskcope* refers to task-oriented coping, *Emotcope* refers to emotion-oriented coping, *Distract* refers to distraction-oriented coping and *Social* refers to social diversion-oriented coping, all as measured by the CISS; *Coghard* refers to cognitive hardiness as measured by the CHS; *GHQ* refers to the General Health Questionnaire; *SCL Somat* refers to the Somatization scale of the SCL90-R, *SCL Dep* refers to the Depression scale of the SCL90-R and *SCL Anx* refers to the Anxiety scale of the SCL90-R. Directions of each main and interaction effect are denoted in brackets after each item: e.g., *LES neg* (+) indicates *LES neg* has a positive direct effect on all dependent measures, in that it directly elevates scores.

* Interactions which have a buffer effect.

Trauma measure results

The trauma measure (Stressful Life Events Screening Questionnaire: SLESQ) did not make a significant contribution to explaining variance in the dependent measures. However, it was interesting to note that the incidence of traumatic events in this population was in line with other international studies examining the incidence of trauma (e.g., Amir & Sol, 1999). 77% of respondents had experienced 1 or more traumatic incidents, with 64% experiencing between 1 and 4 events.

Discussion

Overall, the results of the study have supported the main predictions. Negative life events, as measured by the Life Experiences Survey (Sarason et al., 1978), had a direct effect on all measures of psychological distress, appearing to increase these scores. By contrast, the traumatic events measure did not have a significant relationship to any measure of psychological distress. Consistent with other studies, (Higgins & Endler, 1995; Sharpley & Yardley, 1999; Wilkinson et al., 2000), the main effects model was found to make a substantial and statistically significant contribution to the prediction of the various dependent measures. In addition, the interaction model was also supported in a number of cases with small but significant interaction coefficients. This interaction effect has not been consistently reported (Aldwin & Revenson, 1987; Wilkinson et al., 2000).

Cognitive hardiness emerged as the single most important predictor of decreased scores of psychological and somatic distress, appearing to have a direct effect for both genders in reducing scores on these measures, and a buffer effect in moderating the effects of negative life events by reducing their impact on the GHQ for females. Cognitive hardiness also played a moderating role in mitigating the direct effect of emotion-oriented coping on the depression measure for both genders, and on the

anxiety measure for women. Cognitive hardiness was also involved in two three-way interactions involving negative life events and emotion-oriented coping: the first indicating that high scores in cognitive hardiness appear to reduce the impact of a high level of emotion-oriented coping on the anxiety score for women, at high levels of adverse life events. The second three-way interaction indicates that in relation to the depression score for men, the mitigating effect of cognitive hardiness on high levels of emotion-oriented coping is not as great for high levels of negative life events.

In terms of coping style, emotion-oriented coping had a direct effect in tending to elevate scores on all dependent measures for females, and on all but two measures for the males. Task-oriented coping appeared to have a direct and expected effect on SCL Anxiety for males. Distraction-oriented coping appeared to have a direct effect in reducing somatic symptoms for females, whilst social diversion-oriented coping had the opposite effect for males on the GHQ measure, in that it was associated with increased scores. See Table 10 for a summary of these effects.

Prominent researchers such as Lazarus (1999) have continued to argue that coping is a buffer against stressful life events, but in this study only cognitive hardiness proved to have a buffering effect, though coping styles contributed through direct effects.

Gender differences

Males and females did not have significantly different scores on any of the variables examined, except for distraction-oriented coping and social diversion-oriented coping, where women scored higher than men on both subscales. This is contrary to other studies that have reported that males use more task-oriented coping, females more emotion-oriented coping and social diversion-oriented coping; and that

females experience more somatic symptoms and psychiatric symptomatology generally (Higgins & Endler, 1995).

Consistent with other research (Endler & Parker, 1990b; Haines & Williams, 1997; Higgins & Endler, 1995; Proulx et al., 1995), this study found that for females, emotion-oriented coping appears to be a consistent direct influence in elevating dependent measure scores. This indicates that whilst females do not appear to utilise emotion-oriented coping more often than men, when they do utilise this coping style, it is to their detriment. Females also used distraction-oriented coping with an associated reduction in somatization scores.

As predicted, the main effects model showed males using task-oriented coping to their benefit in tending to lower scores on one dependent measure, that of anxiety. Interestingly, there appears to be a direct effect for social diversion-oriented coping for males in elevating scores on the general measure of psychological symptomatology (GHQ). This was somewhat unexpected, as social support as measured through this subscale has been found to be instrumental for females in decreased scores on similar dependent measures (Billings & Moos, 1981). Perhaps, as Rutter (1990) argues, availability of social support is not the same as how or whether it is utilised. Items from this subscale such as: *Try to be with other people; Visit a friend; Phone a friend* perhaps refer more to availability of social support rather than actually making use of this support. It could be argued that this particular result is more indicative of an avoidant rather than approach coping style, and this interpretation is consistent with the current results. Males also experienced the same influence as females for emotion-oriented coping on the depression measure in that emotion-oriented coping appeared to have a direct effect on depression scores by elevating them.

For both males and females, cognitive hardiness appeared as the most consistent protective variable in terms of its main effect, with high scores in cognitive hardiness appearing to directly reduce scores of psychological distress in seven out of eight dependent measures. For females, cognitive hardiness also had a consistent buffering effect, buffering the impact of adverse life events on measures of psychological distress, and also buffering the direct and negative impact of emotion-oriented coping. The role of cognitive hardiness as a buffer with males was not as apparent. Whilst cognitive hardiness appeared to be a buffer against the negative impact of emotion-oriented coping for males on SCL Depression, there was also a three way interaction on this depression measure involving cognitive hardiness that was not a buffer effect.

Cognitive hardiness

Cognitive hardiness was the single most consistent predictor of decreased scores of psychological and somatic distress in its direct effect role, as well having the most consistent moderator effect. Possessing high levels of cognitive hardiness was shown to be beneficial in appearing to directly reduce scores of psychological distress, irrespective of the frequency of negative life events.

Sharpley and Yardley (1990) reported similar direct effects, but no interaction effects in their study of retirees. They described Kobasa's (1979) components of cognitive hardiness of *control*, *commitment* and *challenge* as applying to their older subjects in the following ways: believing in one's own capabilities (*control*), gaining a strong sense of personal meaning from social activities and enjoying interactions with others (*commitment*), and self-confidence in one's ability to deal with change (*challenge*). It could be suggested that similar mechanisms are at play in this study, and it would be useful in future research to examine the components of this meta-construct of cognitive hardiness, as its role in directly and indirectly influencing

psychological distress appears to be significant. Consequently both main and interaction effects have useful implications for intervention in the promotion of resilient outcomes.

Coping

Nowack's (1989) conceptualisation of the key themes in coping being *approach* and *avoidance* proved to be useful in this study. Emotion-oriented coping can be seen as avoidance oriented coping (Endler & Parker, 1990a), and these results are explicable when viewed this way: that is, emotion-oriented coping had a direct effect in appearing to elevate scores on dependent measures, irrespective of the occurrence of negative life events. On the other hand, distraction-oriented coping tended to lower somatic scores for females, and could be seen as an indication that in some situations, avoidance approaches are efficacious.

Whilst the results for avoidance oriented coping were as expected or at least posed no surprises, approach oriented coping results were not as consistent as expected. High scores on task-oriented coping had an expected effect of appearing to lower anxiety as measured by SCL Anxiety, but only on this one measure, and only for males. Social diversion-oriented coping could be considered to be an approach oriented coping measure: Haines and Williams (1997) describe seeking social support as a problem engagement style of coping, similar to an approach orientation. However, as social diversion-oriented coping appeared to affect GHQ scores for males by elevating them, it has been argued that this is in fact an avoidance measure: ie social *diversion* is sought, rather than social *support*.

Life stress and outcome measures

The life stress measure which made a significant contribution to explaining variance for all the dependent measures for both genders was negative life events, as

measured on the Life Events Scale. This is in line with other research (Higgins & Endler, 1995; Sarason et al., 1985) which indicated that only the negative life events measure was significant in its effect on physical and psychological symptoms. This finding is somewhat contrary to Kessler et al.'s (1985) contention that life event stress has only a small direct effect on adjustment.

The Life Events Scale measures stressful life events for the past 12 months only, and the Stressful Life Events Screening Questionnaire (SLESQ: Goodman et al., 1998) was used to measure traumatic events over a lifetime. Many studies have noted the links between traumatic events and physical and psychological health (Herman, 1997). Despite the mean number of traumatic events experienced in this population being 2.2, and Vrana and Lauterbach (1994) describing traumatic events as being “burned” into memory, it was surprising that the SLESQ did not significantly contribute to variance in any measures of psychological or somatic symptoms. It was interesting to note that the incidence of traumatic events experienced by these participants was commensurate with that reported in other studies. The frequency of participants reporting at least one traumatic event was 67% (Amir & Sol, 1999) and 84% (Vrana & Lauterbach, 1994). In this study 77 % reported having experienced one or more traumatic events, and 64% reported between one and four traumatic events.

Limitations of this study

As a cross-sectional study, this research suffers from problems in interpreting causality, and a prospective study would be useful as a followup. It is important to note that the focus of this study has been limited to testing direct effect and buffer effect models for a small number of possible variables. It has been beyond the scope of this study to examine all key factors associated in a comprehensive model of

psychological health. It is clear that many protective and risk factors have been found to play a major role in psychological outcomes in relation to adversity: that is resilient outcomes. For example, Rutter's (1985) review article identifies some key protective factors that may be 'given' and inaccessible to change (e.g. intelligence, parenting style). However, Rutter (1990) also outlines protective factors that may be amenable to change, stating that they also protect against risk mechanisms (e.g. the ability to act rather than react, and to plan ahead for good outcomes). This study has sought to identify variables that may be amenable to change, and therefore may have clinical implications in promoting resilient outcomes following exposure to adverse life events.

Conclusion

This study has examined coping style and cognitive hardiness in testing the main and buffer effects models of stress for predicting current psychological and somatic functioning and distress. It considered these variables as possible protective mechanisms. First, negative life events had a direct effect on all measures of psychological distress, appearing to increase their scores.

Both main and buffer effects were found. The main effects model was found to be a good predictor in that it accounted for a substantial proportion of the variance of dependent measures. A buffering interaction was also found to be significant in four of the eight analyses, with the occurrence of small but statistically significant additional contributions to the variance accounted for.

Cognitive hardiness proved to have a significant and consistent role in main effects models with both genders. For females, the buffering role of cognitive hardiness was a particularly encouraging result, in that it provides a key to the understanding of resilient outcomes despite exposure to adversity. Cognitive

hardiness buffered the effects of adverse life events by appearing to reduce their impact on measures of psychological distress, and also played a buffering role in appearing to reduce the direct and negative impact of emotion-oriented coping. Cognitive hardiness could be seen as one of the factors involved in ‘steeling’ an individual in response to life stress, and its elements of control, commitment and challenge may well mean that an individual manages adversity in such a way that this strengthening occurs, rather than an increasing vulnerability.

Coping style did not have a buffering effect, but main effects were found. Emotion-oriented coping appeared to have a direct effect in elevating scores on all dependent measures for females, and on all but two measures for the males. Task-oriented coping appeared to have a direct and expected effect on anxiety symptoms for males. Distraction-oriented coping appeared to have a direct effect in reducing somatic symptoms for females, whilst social diversion-oriented coping had the opposite effect for males on the GHQ measure, in that it was associated with increased scores.

Finally, these findings for both cognitive hardiness and coping style have promising clinical and educational implications, as it appears they are indeed protective mechanisms. Building on the work of Nowack (1989), the cognitive hardiness components of control, commitment and challenge are amenable to cognitive behavioural interventions in therapy. Approach-oriented coping strategies also lend themselves to clinical intervention, as has been suggested by Higgins and Endler (1995).

In the promotion of resilient responses to the impact of adversity, building cognitive hardiness and approach coping strategies provides a promising method of strengthening individuals against such negative impact.

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Investigation of resilience in response to life stress

Dear mature age student,

I hope you may be interested in participating in some research which I think may have useful implications for students. Many of you will know that I am completing an MPsych, and this study forms the final part of the degree.

The study you are invited to participate in seeks to identify factors that promote resilience in response to life stress. This study seeks the participation of mature age students, as you are likely to have experienced a range of life circumstances, and to have had to develop methods to manage these events.

If you agree to take part in this study, you will be asked to provide some basic demographic information such as age and gender, and then to complete a range of questionnaires. The questionnaires measure life stress experienced, your current health and happiness, and then factors which may moderate the effects of life stress. These factors are:

1. coping style (how you cope with events)
2. how you perceive events (known as explanatory style)
3. cognitive hardiness (how you manage life events and change)

The questionnaires are relatively simple to complete, and are likely to take up to 45 minutes. Please return in the reply paid envelope attached, or drop into Student Services. (top floor, Union building- above the bar).

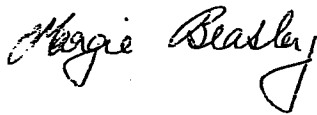
Before you decide to participate, you should know that your participation in this study is completely voluntary and you are free to cease your involvement at any time, without explanation or penalty. Confidentiality will be preserved at all times, as the survey is completely anonymous. No identifying information will be collected or kept, and published results will only refer to group data. This study has received approval from the University Ethics Committee.

If you choose to participate in this project, your consent will be implied by your participation. You should find the questionnaires interesting to complete. Whilst the survey items are unlikely to create discomfort, debriefing will be available by contacting me, or if you would prefer, the University Counselling Service is also available. (ph: 6226 2697)

Please feel free to contact either Ted Thompson or myself should there be any aspect of this project you wish to discuss, or if you would like further information about the outcome of this study. If you have any concerns about the ethical nature of this study, please contact the Chair or the Executive officer of the University Human Research Ethics Committee, Dr. Margaret Otlowski on 6226 7569 or Ms. Chris Hooper, on 6226 2763.

Thanks for your time.

Yours sincerely,



Margaret Beasley
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BA(Hons), BEd(Couns) MAPS
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Dr. Ted Thompson
School of Psychology

Chief investigator: Dr. Ted Thompson, Lecturer, School of Psychology (ph: 6226 2887)

*Other investigator: Margaret Beasley, Head of Counselling Service, MPpsych candidate.
(ph: 6226 2099)*